

*User's Guide*



**Titan™ Series**

**120/320 Channel VHF-Low Band Mobile**

**120/320 Channel VHF-High Band Mobile**

**120/320 Channel UHF-High Band Mobile**



*[www.midlandradio.com](http://www.midlandradio.com)*

## FCC RF EXPOSURE COMPLIANCE REQUIREMENTS FOR OCCUPATIONAL USE ONLY

The FCC has adopted a safety standard for human exposure to RF energy. Proper operation of this radio under normal conditions results in user exposure to RF energy below the Occupational Safety and Health Act and Federal Communication Commission limits.

### **Mandatory Safety Instructions to Installers and Users:**

This radio is **NOT** approved for use by the general population in an uncontrolled environment. This radio is restricted to occupational use and work related operations only. Radio operators must have the knowledge to control their exposure conditions and the exposure conditions of bystanders and/or passengers to satisfy the lower exposure limit allowed for General Population.

To comply with FCC RF exposure limits, **DO NOT** operate the transmitter of this mobile radio when a person outside the vehicle is within 38 inches (94 centimeters) of the antenna.

The antenna supplied by the manufacturer or radio dealer must be mounted at a location such that during radio transmission, no person or persons can come closer than the above indicated minimum safe distance to the antenna, i.e. 38 inches. To comply with current FCC RF exposure limits, the antenna must be installed at or exceeding the minimum safe distance stated above, and in accordance with the requirements of the antenna manufacturer or supplier.

### **Vehicle Installation Instructions:**

The antenna used for this transmitter must be mounted on the center of the roof **ONLY** and must be installed in vehicle having the following characteristics in order to prevent bystanders and passengers from being exposed to levels exceeding the limits for General Population/Uncontrolled Exposure environment:

1. All passengers must be sitting under a solid metal roof.
2. Rooftop width must be at least 76 inches (183 centimeters) OR the edges of the physical boundary of the vehicle must be at least 76 inches apart.

**DO NOT** operate the radio without the proper antenna installed. Do not substitute any antenna for the one supplied or recommended by the manufacturer or radio dealer. The antenna gain must not exceed 0 dBd. By not following the antenna recommendations you may be exposing person(s) to excess radio frequency radiation. You may contact your radio dealer or the manufacturer for further instructions.

**DO NOT** transmit more than 50% of total radio use time (50% duty cycle). Transmitting for more than 50% of the time can cause FCC RF exposure compliance requirements to be exceeded. This radio is transmitting whenever the **TX** icon is displayed on the radio LCD. Pressing the PTT switch on the side of the microphone normally causes the radio to transmit.






*The preceding information is provided to make you aware of RF exposure and how to ensure that this radio is operated within FCC RF exposure limits.*

You, as the qualified end-user of this radio device must control the exposure conditions of bystanders to ensure the minimum separation distance, stated above for satisfying FCC RF exposure compliance, is maintained between the antenna and nearby persons. Transmit only when all person(s) are at least the minimum distance from the properly installed, externally mounted antenna.

## Contents

Contents.....	3
Conventions and Symbols in this Book .....	4
Disclaimer .....	4
Safety .....	4
Introduction .....	6
Radio Models .....	6
Radio Features .....	7
Recommended Accessories and Options .....	8
Radio Controls .....	9
Standard LCD Details.....	9
Deluxe LCD Details .....	9
Standard Control Head.....	9
Standard Control Head.....	10
Deluxe Control Head .....	10
Setup.....	12
Unpacking .....	12
Installation .....	12
Operation .....	13
Turning the Radio On and Off .....	13
Channel Selection .....	13
Group Selection.....	13
Receiving Transmissions from Other Radios.....	13
Transmitting to Other Radios .....	15
Scanning Channels .....	16
Editing Your Scan List .....	20
DTMF ANI .....	21
Squelch and Other Menu Functions .....	21
Check Code Quick Reference .....	22
Specifications (VHF low band).....	23
Specifications (VHF high band) .....	24
Specifications (UHF high band) .....	25
Titan Mobile Connectors .....	26
Microphone Connector .....	26
Mid-Power Connector.....	26
High-Power Connectors .....	26
Warranty Statement.....	27

## **Conventions and Symbols in this Book**

-  This symbol marks a “caution”. Cautions are special notices which you should read and follow carefully to avoid possible damage to your equipment and to avoid potential danger to yourself or other people.
-  This symbol marks an “important point”. Important points are specific instructions which should be followed closely for proper operation.
-  *This symbol marks a “note”. Notes are hints or tips which offer additional information to help you.*




## **Disclaimer**


Midland Radio Corporation is committed to continuous quality improvements, for this reason specifications may change without prior notice.

Every effort has been made to ensure that the information in this document is complete, accurate, and up-to-date. Midland assumes no responsibility for the results of errors beyond its control. The manufacturer of this equipment also cannot guarantee that changes in the equipment made by unauthorized people will not affect the transceiver's performance or functions.

## **Safety**

Your Titan™ mobile transceiver has been carefully designed to give you years of safe, reliable performance. As with all electrical equipment, however, there are a few basic precautions you should take to avoid injury to yourself or damage to the radio:

-  **Read the instructions in this book carefully.** Be sure to save it for future reference.
-  **Read and follow all warning and instruction labels on the radio itself.**
-  **Be sure the PTT button is not pressed when you do not need to transmit.**

- ⚡ **Do not operate the radio near unshielded electrical blasting caps or in an explosive atmosphere.**
  - ⚡ **Do not operate the transmitter of any radio unless all RF connectors are secure.**
  - ⚡ **All equipment must be properly grounded for safe operation.**
  - ⚡ **Do not allow children to operate or play with the radio equipment.**
  - ⚡ **Never attempt to disassemble or service the radio yourself.** All equipment should be serviced by a qualified technician. Contact your local dealer or communications coordinator for assistance.
  - ⚡ **It is mandatory that radio installations in vehicles fueled by liquefied petroleum gas conform to the NFPA 58 standard.** National Fire Protection Association Standard, NFPA 58, applies to radio installations in vehicles fueled by liquefied petroleum (LP) gas with the LP gas container in the trunk or other sealed-off space within the interior of the vehicle. This standard requires that:
    1. Any space containing radio equipment shall be isolated by a seal from the space in which the LP gas container and its fittings are located.
    2. Remote (outside) filling connections shall be vented to the outside.
  - ⚡ **Do not allow the antenna to touch or come in very close proximity with the eyes, face, or any exposed body parts while the radio is transmitting.**
-  *The above warning list is not intended to include all hazards that may be encountered when using this radio.*

## **Introduction**

Congratulations! By choosing the Midland Titan™ mobile transceiver, you have selected a professional grade radio. Its rugged design will provide years of reliable service and exceptional performance.

### **Radio Models**

The models in the Titan mobile radio line allow selection by frequency band, transmit power, control head, and mounting configuration.

**70-0511(X)** - 60 W, VHF low band, standard head, dash mount, B: 36-42 MHz, C: 42-50 MHz  
**70-0514(X)** - 60 W, VHF low band, deluxe head, dash mount, B: 36-42 MHz, C: 42-50 MHz  
**70-0571(X)** - 110 W, VHF low band, standard head, dash mount, A: 30-36 MHz, B: 36-42 MHz, C: 42-50 MHz  
**70-0574(X)** - 110 W, VHF low band, deluxe head, dash mount, A: 30-36 MHz, B: 36-42 MHz, C: 42-50 MHz  
**70-0611(X)** - 60 W, VHF low band, standard head, trunk mount, B: 36-42 MHz, C: 42-50 MHz  
**70-0614(X)** - 60 W, VHF low band, deluxe head, trunk mount, B: 36-42 MHz, C: 42-50 MHz  
**70-0671(X)** - 110 W, VHF low band, standard head, trunk mount, A: 30-36 MHz, B: 36-42 MHz, C: 42-50 MHz  
**70-0674(X)** - 110 W, VHF low band, deluxe head, trunk mount, A: 30-36 MHz, B: 36-42 MHz, C: 42-50 MHz  
**70-1341B** - 50 W, VHF high band, standard head, dash mount, B: 150-174 MHz  
**70-1344B** - 50 W, VHF high band, deluxe head, dash mount, B: 150-174 MHz  
**70-1391B** - 110 W, VHF high band, standard head, dash mount, B: 150-174 MHz  
**70-1394B** - 110 W, VHF high band, deluxe head, dash mount, B: 150-174 MHz  
**70-1441B** - 50 W, VHF high band, standard head, trunk mount, B: 150-174 MHz  
**70-1444B** - 50 W, VHF high band, deluxe head, trunk mount, B: 150-174 MHz  
**70-1491B** - 110 W, VHF high band, standard head, trunk mount, B: 150-174 MHz  
**70-1494B** - 110 W, VHF high band, deluxe head, trunk mount, B: 150-174 MHz  
**70-1541B** - 40 W, UHF high band, standard head, dash mount, B: 450-470 MHz  
**70-1544B** - 40 W, UHF high band, deluxe head, dash mount, B: 450-470 MHz  
**70-1591B** - 100 W, UHF high band, standard head, dash mount, B: 450-470 MHz  
**70-1594B** - 100 W, UHF high band, deluxe head, dash mount, B: 450-470 MHz  
**70-1641B** - 40 W, UHF high band, standard head, trunk mount, B: 450-470 MHz  
**70-1644B** - 40 W, UHF high band, deluxe head, trunk mount, B: 450-470 MHz  
**70-1691B** - 100 W, UHF high band, standard head, trunk mount, 450-470 MHz  
**70-1694B** - 100 W, UHF high band, deluxe head, trunk mount, 450-470 MHz

## Radio Features

The Titan series mobile transceiver is a programmable, synthesized radio featuring:

- ☒ 40 Watts (UHF)/50 Watts (VHF-High Band)/60 Watts (VHF-Low Band) transmit power for mid power radios. 100 Watts (UHF)/110 Watts (VHF-High Band)/110 Watts (VHF-Low Band) transmit power for high power radios
- ☒ 12.5 KHz and 25 KHz channel spacing programmable per channel.
- ☒ Auxiliary button for activation of optional accessories.
- ☒ Software adjusted noise squelch level. The squelch level may be easily adjusted using the menu functions.
- ☒ Flexible scan programming allows for two priority channels to be assigned. Priority scan, priority transmit and priority lookback are standard. Nuisance delete and scan escape functions are available.
- ☒ Extensive and simple scan list editing functions.
- ☒ User selectable scan modes (busy scan, priority scan and public safety scan).
- ☒ 47 CTCSS tones and 104 DCS codes are programmable per channel.
- ☒ A busy channel lockout feature is programmable. An override function is available to allow transmission during repeater hangtime.
- ☒ A transmit time-out timer may be programmed to limit continuous transmission time.
- ☒ The AUX button may be configured to provide repeater talk-around without using an additional channel.
- ☒ 2-tone decode built-in. Individual and group calls can be decoded.
- ☒ A DTMF ANI sequence may be sent on PTT press. A thirty second PTT release timer is standard.
- ☒ Audio companding programmable per channel.
- ☒ Radio alignment is performed using programming software.

## Recommended Accessories and Options

### Microphones

<b>70-2184</b>	DTMF display and programming microphone
<b>70-2185</b>	DTMF microphone
<b>70-2188</b>	Weatherproof microphone
<b>70-2328A</b>	Replacement microphone

### Control Heads, Mounting Brackets and Speakers

<b>70-2202</b>	Standard (three character) control head
<b>70-2203</b>	Deluxe (twelve character) control head
<b>70-2278</b>	Trunk mount conversion kit
<b>70-2290</b>	Under dash mounting bracket
<b>70-2291</b>	Trunk mount tray
<b>70-2358</b>	Remote speaker

### Cables

<b>70-0038</b>	6 meter DC power cable (mid power radios)
<b>70-0039</b>	2 meter DC power cable (mid power radios)
<b>70-0042</b>	2 meter DC power cable (high power radios)
<b>70-0046</b>	6 meter DC power cable (high power radios)
<b>70-0076</b>	6 meter control cable
<b>70-0076QC</b>	7 meter quick connect control cable

### Base Equipment

<b>70-2020D</b>	Tone termination panel (factory install only)
<b>70-2286</b>	11 Amp power supply w/shroud (mid-power radios)
<b>70-2305BT</b>	Desktop microphone

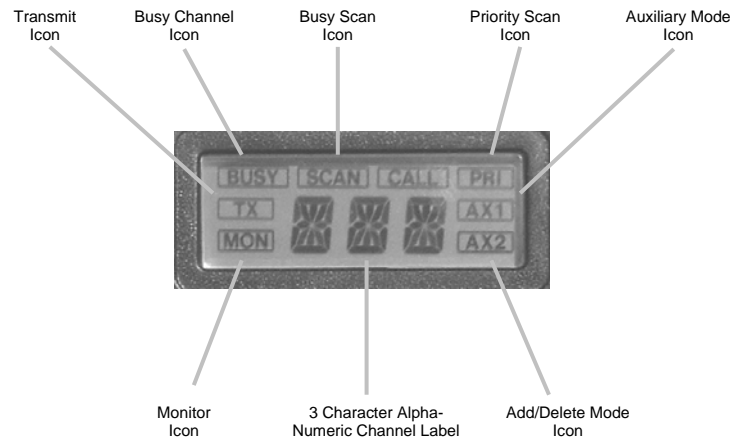
### Options

<b>70-2182</b>	320 channel expansion kit
<b>70-2197</b>	Noise filter
<b>70-2271(A)</b>	Ignition sense kit (factory install only)
<b>70-2945-1A</b>	Internal VHF mobile repeater package for VHF-low and UHF band mobiles (factory install only)
<b>70-2945-2A</b>	Internal UHF mobile repeater package for VHF-low and VHF-high band mobiles (factory install only)

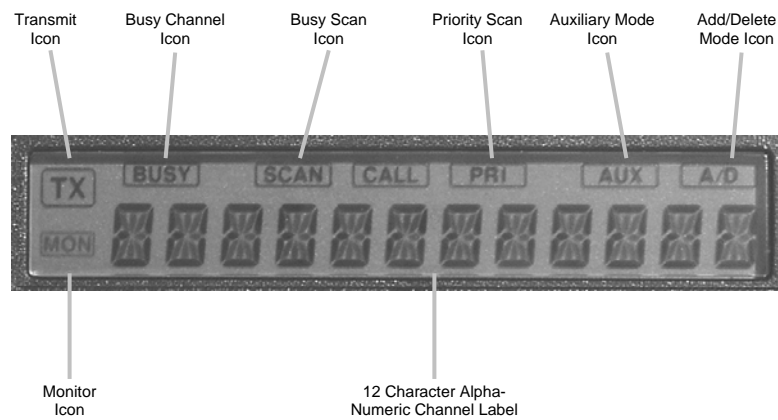


## Radio Controls

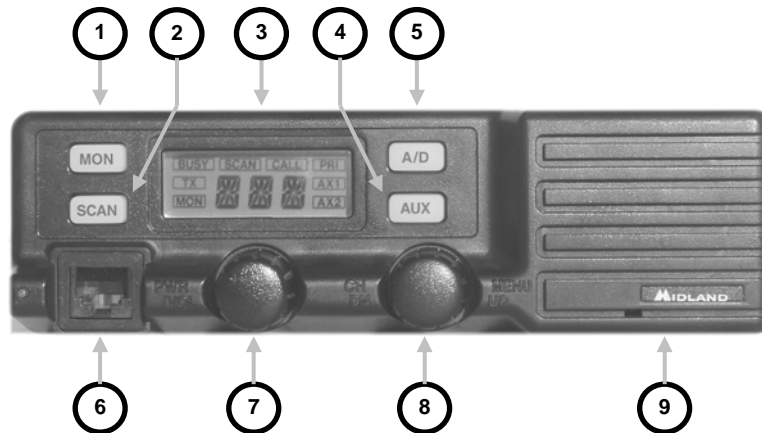
### Standard LCD Details



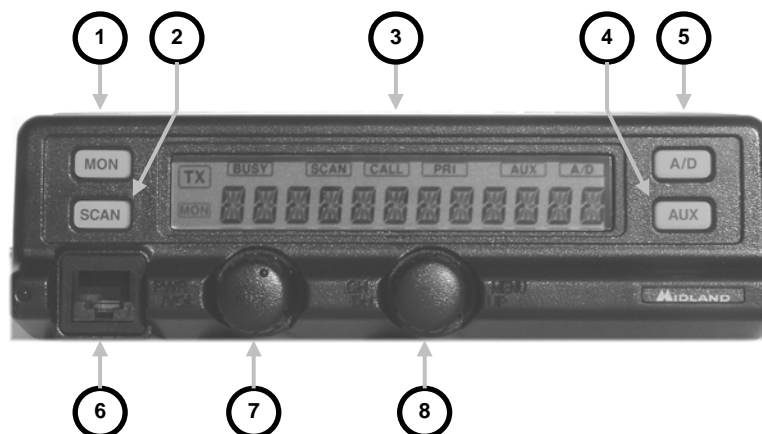
### Deluxe LCD Details



### Standard Control Head



### Deluxe Control Head





1. **MON button** - Press and release the MON button to defeat any programmed CTCSS/DCS and check the radio channel for traffic before transmitting. Press and release the MON button again to return to CTCSS/DCS mode.



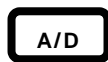
2. **SCAN button** - Press and release the SCAN button to activate scan mode. Depending on the scan mode, the PRI icon (priority scan modes) or SCAN icon (busy scan modes) will be displayed while scan mode is activated. Press and release the SCAN button again to turn scan off. Refer to the detailed scan description for further information.

Press and hold the SCAN button for two seconds to make the selected channel a second priority channel.

3. **LCD display** - Provides channel and operating information.

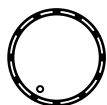


4. **AUX button** - Press and release the AUX button to activate auxiliary functions or options. Scan escape is the default function. The AUX icon (AX1 icon on standard head) will be displayed while the auxiliary function or option is active.

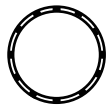


5. **A/D button** - Press and release the A/D button to enter scan list add/delete mode. The A/D icon (AX2 icon on standard head) will be displayed while scan list add/delete mode is active. Press and release the A/D button again to exit scan list add/delete mode. See the scan list editing description for more information.

6. **Microphone jack** – 8 pin modular plug for microphone connection.



7. **Power/Volume knob** - Press and hold for two seconds to turn the radio on. Press and hold again to turn the radio off. Rotate clockwise to increase volume.



8. **Channel/Menu knob** - Rotate to scroll through the available channels. Depending on programming, the channel scroll may stop or rollover when the lowest or highest channel is reached.

Press the knob once to select the first menu function (squellch). Press again to step to the next menu function. Refer to the menu function description for further information.

9. **Internal speaker** - Standard control head only, external speaker required for deluxe head.

## **Setup**

### **Unpacking**

The following items are supplied in the standard package:

- ☒ One transceiver chassis
- ☒ One control head.
- ☒ One microphone.
- ☒ One DC power cord.
- ☒ One mounting bracket or tray.
- ☒ One mounting hardware package.
- ☒ One user's manual.

Additional model dependent equipment:

- ☒ One trunk mount kit
- ☒ One remote speaker (standard with deluxe control head)

### **Installation**

Radio installation should only be done by qualified and trained personnel, familiar with automotive electronics installation, and FCC RF exposure guidelines. This transceiver should be installed in 12V negative ground vehicles only. Complete installation instructions are available in the corresponding radio service manual.

Antenna selection, installation and positioning requires knowledge of RF radiation and exposure conditions and should be performed by qualified personnel only. Please consult your dealer or communications coordinator for more information.

## **Operation**

### **Turning the Radio On and Off**

Press and hold the power/volume knob for two seconds to turn the radio on. The radio will perform a power-on test, which includes lighting all display segments and may sound a single beep when complete. Under certain circumstances, such as after the radio has been reprogrammed, it may also display a check code and sound a triple beep. Rotate the volume knob clockwise to increase the volume.

### **Channel Selection**

Rotate the channel/menu knob to select the channel. The radio may be programmed to stop or *Rollover* when it reaches the highest and lowest channels. Please consult your dealer or communications coordinator regarding channels programmed in your radio.

### **Group Selection**

Your radio channels may be organized into channel groupings that further sort and organize your channels. To select a different group of channels, press the channel/menu knob twice, or until the GRP is displayed, then rotate to the channel/menu knob until the desired new group number or name is displayed. To exit, press the channel/menu knob repeatedly until the first channel in the new group is displayed.

Please consult your dealer or communications coordinator regarding channel groups programmed in your radio.

### **Receiving Transmissions from Other Radios**


Each channel of your radio may be programmed for carrier squelch operation, CTCSS/DCS operation or 2-tone operation. The following paragraphs describe these modes of operation. Ask your dealer or communications coordinator if you have questions on how your radio has been programmed to operate.

## Carrier Squelch Operation

A signal that matches the programmed receive frequency will be heard if it is of sufficient strength to exceed the squelch threshold. An on frequency signal exceeding the squelch threshold level will be indicated by the BUSY icon.

## CTCSS/DCS Operation


CTCSS or DCS signaling adds an additional condition to carrier squelch operation. In addition to the signal having to exceed the squelch threshold level, the received signal must also have the correct CTCSS or DCS tone or code before the audio will be passed to the speaker. CTCSS or DCS signaling allows multiple users on the same frequency to hear only signals which have their correct CTCSS tone or DCS code. An on frequency signal without the correct CTCSS or DCS signal will be indicated by the BUSY icon while no audio is heard.

 *CTCSS/DCS allows multiple users to share the same frequency. However CTCSS/DCS is only useful to avoid disturbing other users with messages not related to them. If more than one radio is transmitting at the same time, this will cause interference. Do not transmit if the BUSY icon is on. Wait until the channel is clear before transmitting.*


## 2-tone Operation

2-tone signaling allows individual or group calls to be made to your radio. On channels programmed for 2-tone decode operation, you can press the channel/menu knob for two seconds to mute all receive signals until the programmed 2-tone signal has been decoded. After the programmed 2-tone signal is decoded, the radio will beep, and subsequent receive audio will be heard over the speaker. Press and hold the channel/menu knob again to mute the radio until it receives a new call. Pressing the MON button or PTT will disable the 2-tone muting function.






 *Consult your dealer or communications coordinator for further details on how your radio has been programmed for 2-tone operation.*

 2-tone signaling allows users to receive only calls intended for them. However, more than one radio transmitting at a time will still cause interference. Do not transmit if the BUSY icon is on. Wait until the channel is clear before transmitting.

## Transmitting to Other Radios

 **Before transmitting, the FCC requires you monitor the channel to make sure it is clear. Transmitting while someone else is transmitting will create interference and disrupt both conversations.**

Follow these steps to transmit to other radios.

1. Monitor the channel by pressing the MON button. Channel activity is also indicated by the BUSY icon.
  2. If the channel is clear, press and hold the push to talk (PTT) switch on the side of the microphone.
  3. The TX icon will display while the radio is transmitting.
  4. Hold the microphone approximately 2 inches from your mouth and speak across the face of the microphone in a clear, normal voice.
  5. Keep the PTT switch pressed until you have finished speaking.
  6. Release the PTT switch to return to receive mode.
-  Do not shout! It will only create distortion.
-  Press PTT before you start talking and release PTT after you have finished speaking.
-  Your radio doesn't allow you to talk and receive simultaneously, so keep your transmission short. When you are transmitting, other people can not. Use common sense and do not occupy the channel too much.
-  The radio might be programmed with a timeout timer which will automatically end your transmission after a preset time. In this case release PTT and wait for a few seconds. The radio transmitter will be enabled again after a few seconds. Ask your dealer or communications coordinator for further details.
-  The radio might be programmed for busy channel lock out, which automatically disables the transmitter if your channel is busy. In this case wait until the channel is clear.

## Scanning Channels

If you have more than one channel programmed, your Titan radio may be programmed to allow you to scan them. Press and release the SCAN button to activate scan. The radio will begin checking all channels in the scan list for activity. The SCAN icon or PRI icon will be displayed while the radio is scanning. To turn scan off, press and release the SCAN button again.

The scan mode and scan list are initially programmed by your dealer or communications coordinator. If a priority scan mode has been selected, the priority channel is checked for activity more often than other channels in the scan list. The priority channel will also be checked for activity while the radio is receiving on a non-priority channel.

Once the receive signal ends, the radio may be programmed to wait a period of time before resuming scan. When the *Scan hold after RX* timer has expired, scanning will resume. There is also a *Scan hold after TX* timer that will be started whenever the radio has ceased transmitting on a channel. Your dealer or communications coordinator will customize the scan options for your particular situation; the following paragraphs detail the available options. The scan mode depends on both the dealer programmed *Scan Selection* and the user selection from the menu functions as outlined in the table.

User menu selection	Dealer programmed <i>Scan Selection</i>			
	Normal	Modify	Second	PS
PRI	Priority scan	Priority scan	Priority Monitor	Public Safety scan
SCN	Busy scan	Alternate Busy scan	Alternate Busy scan	N/A
P/S	N/A	No scan	Priority scan	N/A



## Priority Scan

Priority scan is available when your dealer has programmed *Normal* or *Modify Scan Selection*. Use the menu function to select PRI scan mode.

 *The default user selection is PRI scan mode.*

If enabled in programming, you may assign a second priority channel before starting scan. Select the desired second priority channel using the channel selector, then press and hold the SCAN button for two seconds. The channel display will flash when a second priority channel is displayed.

Press and release SCAN to activate Priority scan. The channel selected when scan is started will be assigned as the first priority channel. The priority channel(s) will be checked more often than the other channels in the scan list. While scanning in Priority scan mode, the radio will display "---" and the PRI icon. If activity is detected on a channel, the radio will pause scan and display that channel. While stopped on a non-priority channel, the radio will continue to check for activity on the priority channel(s). This is called *priority channel lookback*, and the receive audio from the non-priority channel will be briefly interrupted while priority lookback occurs. While the radio is stopped on a non-priority channel it may be deleted from the scan list by briefly pressing the A/D button. This is the *nuisance channel delete* function. The priority channel(s) can not be deleted from the scan list. To resume scanning at the next channel in the scan list, without deleting the channel, rotate the channel/menu knob clockwise.

In Priority scan mode the scan escape function may have been enabled by your dealer or communications coordinator. To temporarily suspend scan and switch to the last received channel, press and release the AUX button. When finished operating on the last received channel, press and release the AUX button again to resume scan operation. The priority channel selections will not be changed by the scan escape function.

## Busy Scan


Busy scan is available when your dealer has programmed *Normal* or *Modify Scan Selection*. Use the menu function to select SCN scan mode.

 *The default user selection is PRI scan mode.*

Press and release SCAN to activate Busy scan. All channels in your scan list will be checked for activity, with no preference given to any channel. While scanning in busy scan mode, the radio will display "---" and the SCAN icon. If activity is detected on a channel, the radio will pause scan and display that channel. While the radio is paused on a channel it may be deleted from the scan list by briefly pressing the A/D button. This is the *nuisance channel delete* function. To resume scanning at the next channel in the scan list, without deleting the channel, rotate the channel/menu knob clockwise.

## Public Safety Scan

Public Safety scan is available when your dealer has programmed *PS Scan Selection*.

 *No user scan mode selection is possible in Public Safety scan mode. The user selection is fixed at PRI scan mode.*

If enabled in programming, you may assign a second priority channel before starting scan. Select the desired second priority channel using the channel selector, then press and hold the SCAN button for two seconds. The channel display will flash when a second priority channel is displayed.


Press and release SCAN to activate Public Safety scan. The channel selected when scan is started will be assigned as the first priority channel. The priority channel(s) will be checked more often than the other channels in the scan list. While scanning in Public Safety scan mode, the radio will display the first priority channel and a flashing PRI icon. While the radio is scanning, the channel knob may be rotated to select and display a new first

priority channel. This is the primary difference between Public Safety scan and Priority scan.

If activity is detected on a channel, the radio will pause scan and display that channel. While stopped on a non-priority channel, the radio will continue to check for activity on the priority channel(s). This is called *priority channel lookback*, and the receive audio from the non-priority channel will be briefly interrupted while priority lookback occurs. While the radio is stopped on a non-priority channel it may be deleted from the scan list by briefly pressing the A/D button. This is the *nuisance channel delete* function. The priority channel(s) can not be deleted from the scan list. To resume scanning at the next channel in the scan list, without deleting the channel, rotate the channel/menu knob clockwise.

### Priority Monitor Mode (Dual watch)

Priority Monitor mode is available when your dealer has programmed *Second Scan Selection*. Use the menu function to select PRI scan mode.

 *The default user selection is PRI scan mode. User selections of SCN (Busy scan) and P/S (Priority scan) are also possible when your dealer has programmed Second Scan Selection.*

If enabled in programming, you may assign a second priority channel before initiating priority monitoring. Select the desired second priority channel using the channel selector, then press and hold the SCAN button for two seconds. The channel display will flash when a second priority channel is displayed.

Press and release SCAN to activate Priority Monitor mode. The channel selected when priority monitoring is started will be assigned as the first priority channel. Then use the channel/menu knob to select a channel of operation, while continuing to monitor the priority channel(s) for activity. While in Priority Monitor mode, the radio will normally display the operating channel and the PRI icon.

If activity is detected on a priority channel the radio will switch to and display the priority channel.

### **Transmitting While in Scan Mode**

In Busy scan mode, when PTT is pressed while scanning, the radio will transmit on the last received channel. If no last receive channel has been established since scan was started, transmit will occur on the scan start channel.

In Priority scan or Public Safety scan mode, the radio will always transmit on the first priority channel while scan is turned on. The first priority channel will also always be displayed while transmitting.

If Priority Monitor mode has been activated, the radio will always transmit on the displayed channel (whether operating channel or priority channel(s)).

### **Editing Your Scan List**


One of the features of your Titan mobile radio is the ability to add channels and groups of channels to your scan list. Of course, you may also delete channels from your scan list. These changes are saved in radio EEPROM and are not temporary. Depending on dealer programming the scan list edits may be retained indefinitely or may be reset when scan or the radio are turned off. Or, you may reset the scan list back to dealer programming at any time by pressing the A/D button until the second beep is heard.

The channels in your radio may be organized into groups and a menu function allows you to select whether the scan will check only channels in the current group or in all groups. Then within each group, each individual channel may be selected for scan. As you are editing the scan list, if the PRI icon or SCAN icon is on, the channel is currently in the scan list. If the neither icon is on that channel will not be scanned.

Press and release the A/D button to enter scan add/delete mode. The A/D icon (AX2 on standard head) will be displayed while scan add/delete mode is active. Once you are in add/delete mode, use the channel knob to scroll through the channels. To add a channel to the scan list, or remove a channel that is already in the list, press and release the scan button. The PRI or SCAN icon will toggle on/off indicating scan list status. Press and release the A/D button again to exit add/delete mode.

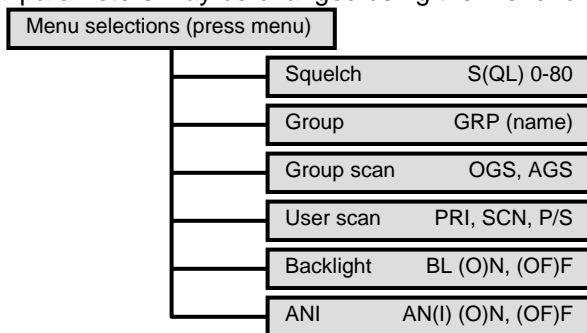
### DTMF ANI

The Titan mobile radio may be programmed to automatically send a DTMF ANI signal when you press PTT on certain channels. Or, if ANI has been configured by programming, but not enabled for the channel, you can use the menu function to temporarily enable ANI.

 A thirty second release timer will be started each time you release PTT. The ANI will not be sent unless this timer has expired.

### Squelch and Other Menu Functions

Several parameters may be changed using the menu functions.




1. Press the channel/menu knob to select the first menu item, squelch level, SQL.
2. Rotate the channel/menu knob to change the squelch level. The squelch adjustment range is 0 – 80, where 80 is the least sensitive or tight squelch position. Adjust squelch at least five steps above threshold (after BUSY icon extinguishes) for best operation.


3. Press the channel menu knob again to save the new squelch setting and proceed to next menu item, group selection, GRP.

**! The squelch setting is written to EEPROM by pressing the channel/menu knob. If the menu function is left to timeout, the new squelch setting will not be saved, and the radio will revert to the previous settings at power-on.**

4. Rotate the channel/menu knob to select a new channel group.
5. Press the channel/menu knob to proceed to the next menu item, group scan selection.

 *This item only appears on the menu if more than one channel group has been programmed.*

6. Rotate the channel/menu knob to select one group scan, OGS or all group scan, AGS.
7. Press the channel/menu knob to proceed to the next menu item, scan selection.
8. Rotate the channel/menu knob to select PRI, SCN or P/S. Follow the same steps to set the additional menu items, backlight and ANI on/off.

 *Please see the appropriate sections for further details, not all selections may be available.*

## Check Code Quick Reference

Display	Description	Action
E(rr)1	MCU RAM/ROM error	Service required (radio not operational)
E(rr)2	No model or channel data	Re-program with corrected data
E(rr)3	Synthesizer unlock	Check frequency programming or call for service
E(rr)4	Channel data checksum	Re-program with corrected data
E(rr)6	RAM/ROM data conflict	Call for service (radio operational)
E(rr)7	EEPROM backup data reset	Turn radio off by front panel to write new backup data
E(rr)8	Serial communication error	Check connections and retry
E(rr)9	Cloning error	Check instructions and retry.

## Specifications (VHF low band)

General specifications	Mid-Power	High-Power
Frequency range	A: 30-36 MHz, B: 36-42 MHz, C: 42-50 MHz	
FCC ID numbers	NCP700511B NCP700511C	MMA700671A NCP700671B NCP700671C
FCC type acceptance	Part 90	Part 90
Maximum number of channels	120 or 320 opt.	120 or 320 opt.
Maximum number of groups	40	40
Channel spacing	20 KHz	20 KHz
Channel stepping	2.5/5.0/6.25 KHz	2.5/5.0/6.25 KHz
CTCSS/DCS per channel	47 CTCSS/104 DCS	47 CTCSS/104 DCS
Input voltage	13.6 Vdc $\pm$ 15%	13.6 Vdc $\pm$ 15%
MIL spec	810E Rain, Salt, Fog & Vibration	
Size (HxWxD)	2.75x7.25x8.75 in (70x184x222 mm)	2.75x7.25x14.0 in (70x184x356 mm)
Weight	6.0 lbs (2.7 kg)	10.2 lbs (4.6 kg)
<b>EIA/TIA-603 receiver specs</b>		
Frequency stability (-30° to +60° C)	$\pm$ 2.5 ppm	$\pm$ 2.5 ppm
12 dB SINAD sensitivity	0.25 $\mu$ V	0.25 $\mu$ V
Selectivity	90 dB ( $\pm$ 20 KHz)	90 dB ( $\pm$ 20 KHz)
Intermodulation rejection	80 dB ( $\pm$ 50/ $\pm$ 100 KHz)	80 dB ( $\pm$ 50/ $\pm$ 100 KHz)
Spurious rejection	80 dB	80 dB
Acceptable radio freq displacement	$\pm$ 2 KHz WB	$\pm$ 2 KHz WB
Squelch sensitivity	0.18 $\mu$ V max	0.18 $\mu$ V max
Audio response	per EIA/TIA-603 specs	per EIA/TIA-603 specs
Audio output <5% THD into 8 $\Omega$	5W int./10W ext.	5W int./10W ext.
RF input impedance	50 $\Omega$	50 $\Omega$
<b>EIA/TIA-603 transmitter specs</b>		
RF power output	60 Watts	110 Watts
Frequency stability (-30° to +60° C)	$\pm$ 2.5 ppm	$\pm$ 2.5 ppm
Modulation type	16KOF3E	16KOF3E
Adjacent channel emissions	70 dB	70 dB
Spurious emissions	80 dB	80 dB
FM hum & noise	50 dB	50 dB
Audio response	per EIA/TIA-603 specs	per EIA/TIA-603 specs
Audio distortion (1KHz @ 60%dev.)	<2%	<2%
RF output impedance	50 $\Omega$	50 $\Omega$

## Specifications (VHF high band)

General specifications	Mid-Power	High-Power
Frequency range	B: 150-174 MHz	B: 150-174 MHz
FCC ID numbers	NCP701341B	NCP701491B
FCC type acceptance	Part 90	Part 90
Maximum number of channels	120 or 320 opt.	120 or 320 opt.
Maximum number of groups	40	40
Channel spacing	12.5/25/30 KHz	12.5/25/30 KHz
Channel stepping	2.5/5.0/6.25 KHz	2.5/5.0/6.25 KHz
CTCSS/DCS per channel	47 CTCSS/104 DCS	47 CTCSS/104 DCS
Input voltage	13.6 Vdc $\pm$ 15%	13.6 Vdc $\pm$ 15%
MIL spec	810E Rain, Salt, Fog & Vibration	
Size (HxWxD)	2.75x7.25x8.75 in (70x184x222 mm)	2.75x7.25x14.0 in (70x184x356 mm)
Weight	6.0 lbs (2.7 kg)	10.2 lbs (4.6 kg)
<b>EIA/TIA-603 receiver specs</b>		
Frequency stability (-30° to +60° C)	$\pm$ 2.5 ppm	$\pm$ 2.5 ppm
12 dB SINAD sensitivity	0.25 $\mu$ V	0.25 $\mu$ V
Selectivity	85 dB ( $\pm$ 25/ $\pm$ 30 KHz)	85 dB ( $\pm$ 25/ $\pm$ 30 KHz)
Intermodulation rejection	75 dB ( $\pm$ 12.5 KHz) 80 dB ( $\pm$ 25 KHz)	75 dB ( $\pm$ 12.5 KHz) 80 dB ( $\pm$ 25 KHz)
Spurious rejection	80 dB	80 dB
Acceptable radio freq displacement	$\pm$ 1 KHz NB/ $\pm$ 2 KHz WB	$\pm$ 1 KHz NB/ $\pm$ 2 KHz WB
Squelch sensitivity	0.18 $\mu$ V max	0.18 $\mu$ V max
Audio response	per EIA/TIA-603 specs	per EIA/TIA-603 specs
Audio output <5% THD into 8 $\Omega$	5W int./10W ext.	5W int./10W ext.
RF input impedance	50 $\Omega$	50 $\Omega$
<b>EIA/TIA-603 transmitter specs</b>		
RF power output	50 Watts	110 Watts
Frequency stability (-30° to +60° C)	$\pm$ 2.5 ppm	$\pm$ 2.5 ppm
Modulation type	16KOF3E/11KOF3E	16KOF3E/11KOF3E
Adjacent channel emissions	80 dB	80 dB
Spurious emissions	80 dB	80 dB
FM hum & noise	50 dB	50 dB
Audio response	per EIA/TIA-603 specs	per EIA/TIA-603 specs
Audio distortion (1KHz @ 60%dev.)	<2%	<2%
RF output impedance	50 $\Omega$	50 $\Omega$

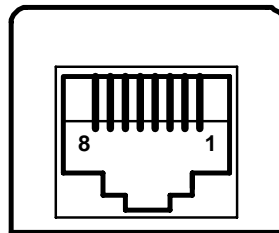


## Specifications (UHF high band)

General specifications	Mid-Power	High-Power
Frequency range	B: 450-470 MHz	B: 450-470 MHz
FCC ID numbers	NCP701541B	NCP701691B
FCC type acceptance	Part 90	Part 90
Maximum number of channels	120 or 320 opt.	120 or 320 opt.
Maximum number of groups	40	40
Channel spacing	12.5/25 KHz	12.5/25 KHz
Channel stepping	5.0/6.25 KHz	5.0/6.25 KHz
CTCSS/DCS per channel	47 CTCSS/104 DCS	47 CTCSS/104 DCS
Input voltage	13.6 Vdc $\pm$ 15%	13.6 Vdc $\pm$ 15%
MIL spec	810E Rain, Salt, Fog & Vibration	
Size (HxWxD)	2.75x7.25x8.75 in (70x184x222 mm)	2.75x7.25x14.0 in (70x184x356 mm)
Weight	6.0 lbs (2.7 kg)	10.2 lbs (4.6 kg)
<b>EIA/TIA-603 receiver specs</b>		
Frequency stability (-30° to +60° C)	$\pm$ 2.5 ppm	$\pm$ 2.5 ppm
12 dB SINAD sensitivity	0.25 $\mu$ V	0.25 $\mu$ V
Selectivity	75 dB ( $\pm$ 25 KHz)	75 dB ( $\pm$ 25 KHz)
Intermodulation rejection	75 dB ( $\pm$ 12.5 KHz) 80 dB ( $\pm$ 25 KHz)	75 dB ( $\pm$ 12.5 KHz) 80 dB ( $\pm$ 25 KHz)
Spurious rejection	80 dB	80 dB
Acceptable radio freq displacement	$\pm$ 1 KHz NB/ $\pm$ 2 KHz WB	$\pm$ 1 KHz NB/ $\pm$ 2 KHz WB
Squelch sensitivity	0.18 $\mu$ V max	0.18 $\mu$ V max
Audio response	per EIA/TIA-603 specs	per EIA/TIA-603 specs
Audio output <5% THD into 8 $\Omega$	5W int./10W ext.	5W int./10W ext.
RF input impedance	50 $\Omega$	50 $\Omega$
<b>EIA/TIA-603 transmitter specs</b>		
RF power output	40 Watts	100 Watts
Frequency stability (-30° to +60° C)	$\pm$ 2.5 ppm	$\pm$ 2.5 ppm
Modulation type	16KOF3E/11KOF3E	16KOF3E/11KOF3E
Adjacent channel emissions	80 dB	80 dB
Spurious emissions	80 dB	80 dB
FM hum & noise	50 dB	50 dB
Audio response	per EIA/TIA-603 specs	per EIA/TIA-603 specs
Audio distortion (1KHz @ 60%dev.)	<2%	<2%
RF output impedance	50 $\Omega$	50 $\Omega$

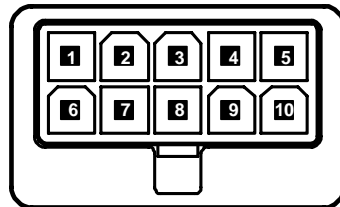
## Titan Mobile Connectors

### Microphone Connector



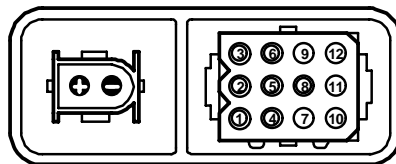
1. Mic audio
2. PTT
3. Mic ground
4. Hang-up (JP2) or +12V (JP1)
  - Remove accessory hang-up loop to use mic hang-up.
  - Remove JP2 and install JP1 for DTMF microphones.
5. RD
6. SD
7. RTS
8. CTS

### Mid-Power Connector



1. Aux 1
2. Ground
3. Hang-up
  - Normally grounded.
4. Speaker 2
5. Internal Speaker
  - Looped to pin 5 for internal speaker.
6. Speaker 1
7. Ground
8. Aux 2
9. +13.6 Vdc
10. +13.6 Vdc

### High-Power Connectors



1. Aux 1
2. Hang-up ground
3. Hang-up
  - Normally looped to pin 2.
4. Speaker 2
5. Internal Speaker
  - Looped to pin 5 for internal speaker.
6. Speaker 1
7. NC
8. Aux 2
- 9-12. NC



## **Warranty Statement**

Midland Radio Corporation (herein, Midland) warrants each new radio product manufactured or supplied by it to be free from defects in material and workmanship under normal use and service for a period listed below, provided that the user has complied with the requirements stated herein.

The Warranty period begins on the date of purchase from an Authorized Midland Sales and Service Outlet. This Warranty is offered to the original end user and is not assignable or transferable. Midland is not responsible for any ancillary equipment attached to or used in conjunction with Midland products.

Midland offers to the original end user a Two (2) Year Limited Warranty on Midland Business and Industrial radio products. Accessories carry a One (1) Year Limited Warranty.

During this period, if the product fails to function under normal use because of manufacturing defect(s) or workmanship, it should be returned to the Authorized Midland Sales and Service Outlet from which it was purchased. The Sales and Service Outlet will repair the product or return the product for repair to Midland or its Authorized Repair Depot. The user is responsible for the payment of any charges or expenses incurred for the removal of the defective product from the vehicle or other site of its use; for the transportation of the product to the Sales and Service Outlet; for the return of the repaired / replacement product to the site of its use and for the reinstallation of the product.



Midland shall have no obligation to make repairs or to cause replacement required, which results from normal wear and tear or is necessitated in whole or in part by catastrophe, fault or negligence of the user, improper or unauthorized alterations or repairs to the Product, incorrect wiring, use of the Product in a manner for which it was not designed or by causes external to the Product. This Warranty is void if the product serial number is altered, defaced or removed.

Midland's sole obligation hereunder shall be to replace or repair the Product covered in this Warranty. Replacement, at Midland's option, may include a similar or higher-featured product. Repair may include the replacement of parts or boards with functionally equivalent reconditioned or new parts or boards. Replaced parts, accessories, batteries or boards are warranted for the balance of the original time period. All replaced parts, accessories, batteries or boards become the property of Midland.

**THE EXPRESS WARRANTIES CONTAINED HEREIN ARE IN LIEU OF ALL OTHER WARRANTIES, EITHER EXPRESSED OR IMPLIED OR STATUTORY, INCLUDING, WITHOUT LIMITATION, ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.**

**FOR ANY PRODUCT WHICH DOES NOT COMPLY WITH THE WARRANTY SPECIFIED, THE SOLE REMEDY WILL BE REPAIR OR REPLACEMENT. IN NO EVENT WILL MIDLAND BE LIABLE TO THE BUYER OR ITS CUSTOMERS FOR ANY DAMAGES, INCLUDING ANY SPECIAL, INCIDENTAL, INDIRECT OR CONSEQUENTIAL DAMAGES, OR FOR THE LOSS OF PROFIT, REVENUE OR DATA ARISING OUT OF THE USE OF OR THE INABILITY TO USE THE PRODUCT.**

This warranty is void for sales and deliveries outside of the U. S. A. and Canada.

-  ***This device complies with Part 15 of the FCC Rules. Operation is subject to the condition that this device does not cause harmful interference.***
-  ***This radio operates in FCC regulated frequency bands. All radios must be licensed by the FCC before use. Because this radio contains a transmitter, Federal law prohibits unauthorized use or adjustments of this radio.***



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